

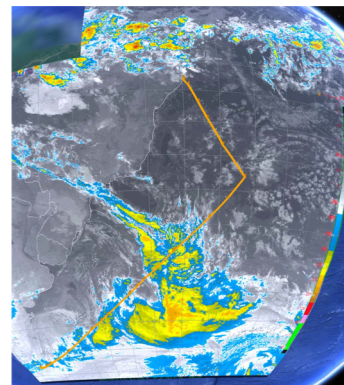
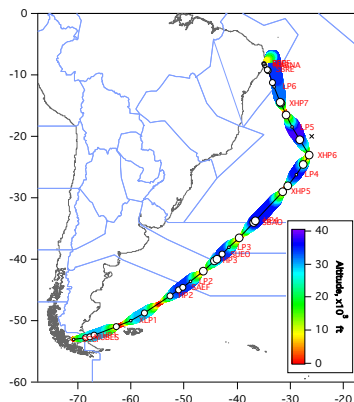
ATom-4 Science Flight Report RF08 (PUQ – REC) 2018 05 12

Takeoff 11:28 UTC

Duration 10.0 hours

Mission Science Tom Ryerson

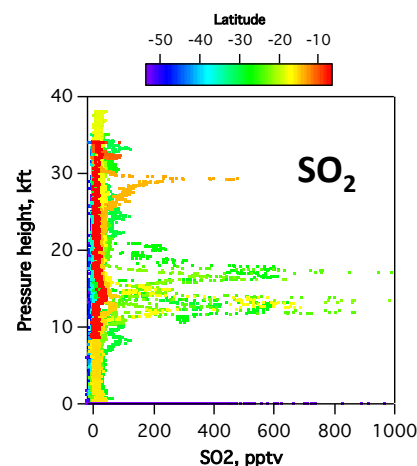
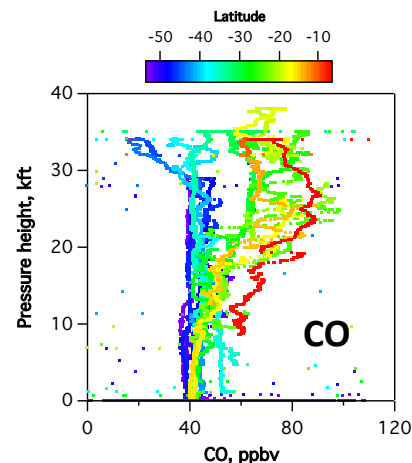
Mission Meteorology Eric Ray



This flight sampled the South Atlantic between Punta Arenas, Chile and Recife, Brazil, transitioning from the (relatively) clean high latitudes to the much more polluted mid-latitudes and tropics. Six dips were planned; fuel and good weather predicted for landing allowed for seven dips en route.

Flight notes

Altitude profiles show a relatively clean high latitude free troposphere, with stratospheric air encountered above 29 kft on the 2nd and 3rd high legs. We climbed to cross convection along a cold front, skimming the outflow cloud shield on our 5th high leg at 35 kft and detecting very polluted S. American continental outflow and lighting NO_x enhancements detrained from the outflow just below us. Profiles into the edge of a S. Atlantic subtropical high located East of our easternmost point showed cleaner, aged air in the MBL, underneath significant pollution in S. American outflow from 8 to 39 kft. Forecast SO_2 enhancements from continental sources were detected, up to 1 ppbv but in relatively thin, discrete layers throughout the free troposphere between 10 and 30 kft. Particle nucleation was observed at altitude in the tropics, but number concentrations were small, possibly due to the large surface area of preexisting aerosol in the polluted outflow.



*High Pt. 5: Convective outflow
embedded in stratocumulus*



TR photo

Dip 6: Subtropical high, 26.5°E, 23°S



Eric Ray photo